ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Recycling Plastics

Plastics in Solid Waste

Types of Plastics -- Hundreds of different plastics are used in consumer and industrial products in the United States, ranging from very common plastics that are produced and used by the millions of tons to very specialized formulations produced in lots of only a few dozen pounds. Nationwide, six plastics account for over seventy percent of all plastics sales. These are low density polyethylene ("LDPE," 17 percent), polyvinyl chloride ("PVC," 15 percent), high density polyethylene ("HDPE," 14 percent), polypropylene ("PP," 13 percent), polystyrene ("PS," 9 percent) and polyethylene terephthalale ("PET" 4 percent).

Weight and Volume -- Plastics account for about 9.1 percent by weight of municipal solid waste (MSW). Because plastics are lighter than many other materials in MSW, they contribute a larger proportion of MSW volume -- approximately 20 percent. About 80 percent of plastics come from residential sources, and 20 percent from commercial and industrial sources. About 28 percent of plastics that are discarded are in durable products (appliances, furniture, etc.), about 25 percent are in nondurable products (plates and cups, trash bags, etc.), and about 48 percent are in containers and other packaging. The plastics that are most commonly recycled -- PET soda bottles and other containers, HDPE milk jugs, and other HDPE containers -- account for 3 percent, 3 percent, and 5 percent, respectively, of all plastics that are discarded (0.2 percent, 0.3 percent, and 0.5 percent by weight of all MSW).

Disposal -- The primary concern related to plastics disposal in landfills is the fact that they do not degrade. Plastics have a very high "BTU content" (an expression of their heat value as fuel), approximately equivalent to the heat released by fuel oil, and two to four times greater than mixed MSW. Plastics also burn with very little ash, and so are a valued component of the fuel mix in waste-to-energy incinerators. Most environmental concerns associated with plastics combustion have been related to hydrochloric acid gas emissions from polyvinyl chloride (PVC). However, PVC accounts for only 7% of all plastics in MSW, mostly in construction and demolition waste. A more general concern is that plastics disposal represents a waste of a valuable, non-renewable resource, because plastics are manufactured from oil and natural gas.

Plastic Recycling

Collection, Processing, and Storage -- The plastics most commonly collected for recycling are PET containers (primarily soda bottles), HDPE milk jugs, and rigid, mixed color HDPE containers (#2, detergent bottles, etc.). Recycling of one or more plastics is available to over three-fourths of New Hampshire residents through curbside or dropoff recycling programs. Most other common plastics (e.g., grocery bags, polystyrene foams, etc.) are also recyclable, but their

very small volume in MSW (compared to other recyclable materials) generally excludes them from municipal recycling efforts.

The light weight and strength that make plastics a desirable packaging material can also make them problematical to recycle. For their weight, plastics consume a very large amount of space in curbside collection vehicles and curbside and dropoff storage facilities, and a large volume of plastics must be collected before they can be economically processed and marketed. Plastic containers must also be carefully sorted by resin type before they can be sold into recycling markets. This is a particular concern for PET bottles, which can be contaminated by only a small number of look-alike PVC containers.

The Resin Identification Code

The resin identification code was introduced in 1988 by the Society of the Plastics Industry (SPI; the largest plastics trade association) as a voluntary measure to aid in plastics identification for recycling. The code has since been made mandatory on rigid containers in 39 states. The code includes a number from 1 through 7 surrounded by chasing arrows, plus a resin acronym. Professional recyclers and the general public have encountered significant problems with the code, because most coded plastics are not recyclable in the majority of U.S. communities, and because the code is ambiguous (e.g., not all "2's" can be recycled together).

Manufacturing -- Recycled plastics are typically chipped, washed, and heated to produce pellets or flakes that can be manufactured into secondary products. Some mixed plastic items can be separated by weight into their component resins, but in general, plastics must be separated before they are used in a secondary manufacturing process. Technologies to automatically sort mixed plastics are still several years away from widespread use.

Items manufactured from recycled PET include carpet fiber, fiberfill insulation for jackets and sleeping bags, appliance casings and handles, and floor tiles; only a limited volume is currently recycled back into containers. Recycled HDPE is manufactured into items such as flower pots, pipes, toys, and pails and drums; the proportion recycled back into containers is small but growing. Mixed plastics can be recycled for relatively non-demanding applications such as "lumber" for docks, traffic stops and park benches.

Markets for Recycled Plastics -- Historically, markets for recycled plastics have been subject to significant fluctuation. Most plastics recycled in New Hampshire communities are marketed outside of New England. Prices for recycled plastics are directly related to prices for oil and natural gas and worldwide virgin plastics production. Like all recyclable commodities, prices tend to fluctuate as a result of supply and demand. Buying products made from recycled materials helps to keep markets strong.

For More Information -- Additional information on recycling plastics and other materials in New Hampshire is available from: NH Department of Environmental Services, Waste Management Division, 29 Hazen Drive, Concord, NH 03301; Telephone: 603-271-2900; TDD Access: Relay NH 1-800-735-2964.